

Web Accessibility

by Kelsey Hawley

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1

What is Accessibility?

2

Making your website available and usable to all people, regardless of physical or mental capabilities

Why should we care?

3

It's the Law

- **ADA (American Disabilities Act)**
 - Title II, which states that communications with persons with disabilities must be "as effective as communications with others"
 - Title III, which deals with
- **Rehabilitation Act - Section 508**
 - Businesses must comply with Section 508 when supplying Electronic and Information Technology goods and services to the federal government.
 - Especially applicable:
1194.22 Web-based intranet and internet information and applications
- **Individuals with Disabilities Education Act (IDEA)**
 - Teaching curriculum is less likely to be included if it is not easily accessible to all students.

<http://www.access-board.gov/guidelines-and-standards>

<http://webaim.org/articles/laws/usa/>

<http://uxmag.com/articles/accessibility-and-the-law>

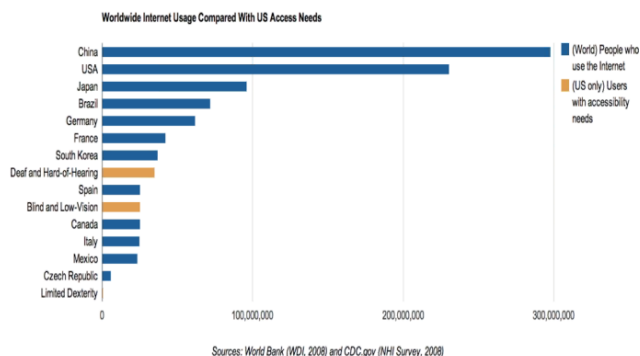
4

But they're a minority, right?

- 19.9 million (8.2%) have difficulty lifting or grasping. This could, for example **impact their use of a mouse or keyboard**.
- 15.2 million (6.3%) have a cognitive, mental, or emotional impairment.
- 8.1 million (3.3%) have a vision impairment. These people might rely on a **screen magnifier or a screen reader**, or might have a form of **color blindness**.
- 7.6 million (3.1%) have a hearing impairment. They might rely on **transcripts and / or captions** for audio and video media.

5

The Myth of the "Minority User"



<http://www.interactiveaccessibility.com/accessibility-statistics>

6

SEO Ranking

- While Google and others don't *directly* rank based on accessibility, SEO & Accessibility are related.
- Improving your accessibility - intuitive navigation, logical headers, labeled images + links - will improve SEO

7

Who is it for?

8

The Visually Impaired

- Color Blindness
 - High contrast between images and colors.
- Partial Blindness
 - High contrast colors
 - Users may rely on text magnification
 - Avoid small text
- Full Blindness
 - Users will use *screen readers*



<http://www.colourblindawareness.org/colour-blindness/types-of-colour-blindness/>

9

Color blindness photos: (Left to Right,
Top to Bottom)
Normal - Protanopia
Deuteranopia - Tritanopia
Achromatopsia

The Motor Impaired

- Mouth Sticks
<https://youtu.be/M6-To6bvpwI?t=24s>
- Make buttons/links *keyboard* accessible
- *Skip Navigation* link



10

Image from:

<http://davidpierini.com/press/the-long-road-back/>

The Hearing Impaired

- Supply captions/transcripts
- Do not rely on sounds/audio alerts to convey information

11

General Accessibility

- Make use of the css *:focus* & js *.focus()* for all buttons, links, clickable objects
- Keep your DOM content in order with the visual appearance. (Don't tab through links in an unexpected way)

12

How to diagnose

13

Webaim's WAVE plugin

- <http://wave.webaim.org/>
- Google Chrome & Firefox extensions
- Will catch *most* glaring problems
- Will recognize the fixes you *have* made
- Explains problems & recommends fixes

14

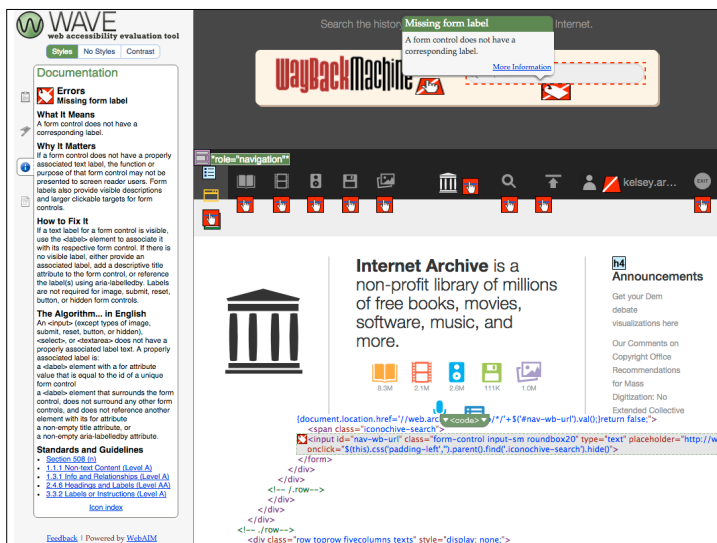
Before WAVE



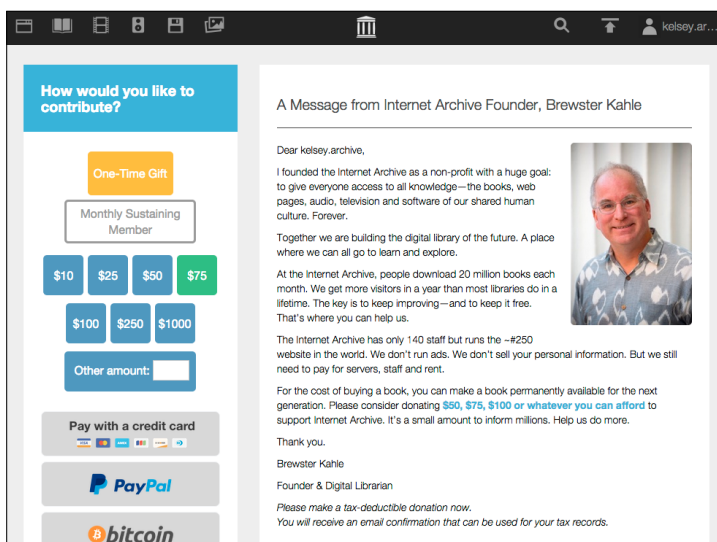


After WAVE

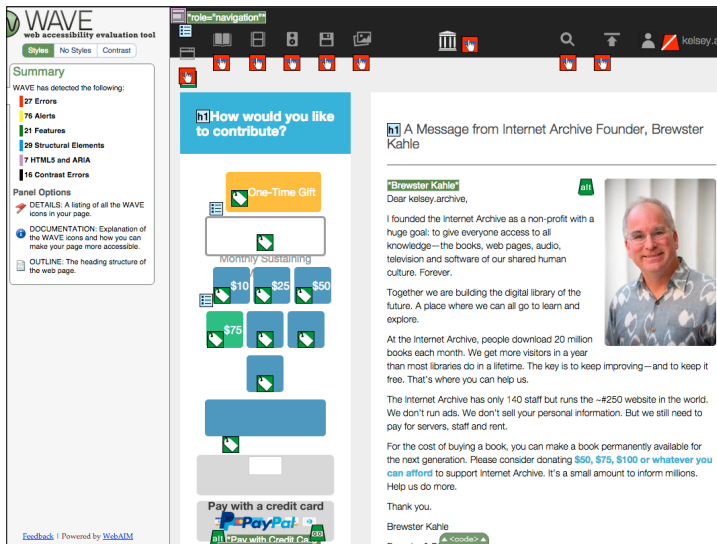
- lots of red
- a couple green



- Details on the missing form label
- WAVE documentation on the missing label
- expanded code for details



Donate page I recently redid



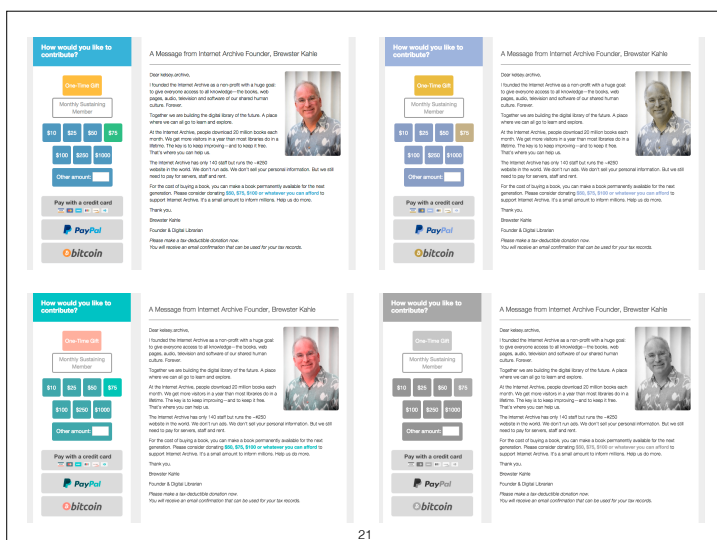
Passes the content with flying green colors
(Nav is sitewide known broken)

Spectrum Chrome Extension

- Spectrum - Chrome Webstore
- “Instantly test your web page with different types of color vision deficiency.”
- Helps designers + developers be aware of their color choices and how viewable a page's content is

20

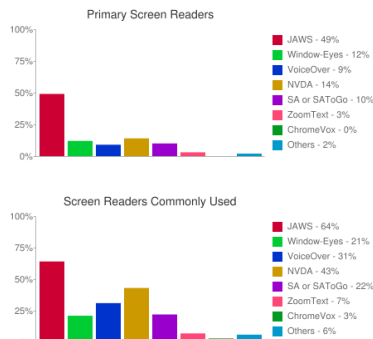
Donate page with: (Left to Right, Top to Bottom)
Normal - Protanopia
Tritanopia - Achromatopsia



21

Screen Readers

- JAWS (Windows)
- Window-Eyes (Windows)
- Voice Over (Mac)
- NVDA



<http://webaim.org/projects/screenreadersurvey4/>

22

Voice Over

- Easy to setup on Mac (and iOS)
- Read the Keyboard Command Shortcuts
<http://www.apple.com/accessibility/resources/>
- Try it with Safari and Chrome (and Firefox)
- Run through some tutorials
<http://webaim.org/articles/voiceover/>

23

System Preferences -> Accessibility -> VoiceOver (Cmd+F5)
Safari Preferences -> Advanced -> Accessibility
check the box "Press Tab to highlight each item on a webpage"

VoiceOver Command Charts at
[http://www.apple.com/accessibility/
resources/](http://www.apple.com/accessibility/resources/)

How to code

25

Code to web standards

Seriously.

Run your html through the W3C validator.

Valid HTML code is *much* easier for screen readers to parse and interpret. And the validator has some accessibility checking built in.

We should be coding to web standards anyway.

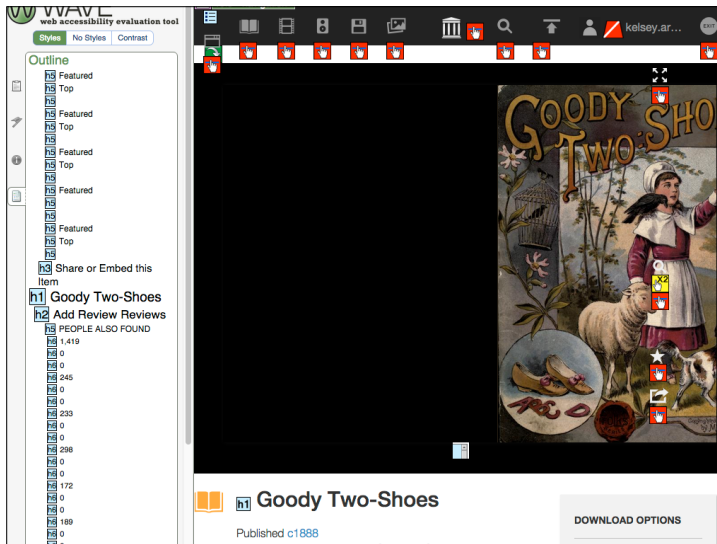
26

<https://validator.w3.org/>

Logical Headings

- Primary method for Screen Reader Navigation
- Think about the order in which content will be consumed. Use an outline if it helps
- Go in order: H1, H2, H3, H2, H3, H1
Not: H3, H1, H4, H2,
- Don't skip headers!

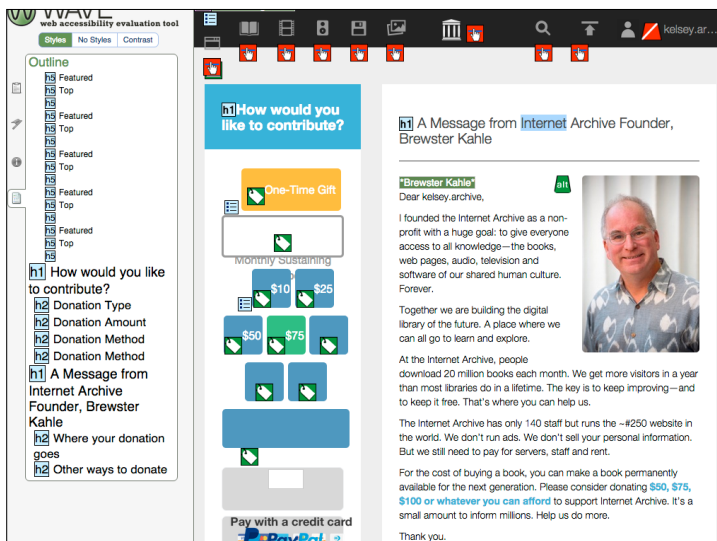
27



Unordered, skipped, unhelpful headers

h6 - "0" ?

h1, h2, h5, h6.....



(ignore the nav bar, with all its h5's....)

Logical, ordered headers, with readable/useful text

h1, h2, h2, h2, h2, h1, h2, h2

Images

- Use **alt text** ``
<http://webaim.org/techniques/alttext/>
- Every image must have an alt attribute. It should contain the **content** and/or the **function** of the image.
- Without **alt text**, a screen reader may resort to reading the entire url of the image, as a substitute for description.

The following examples are pulled from the above link about alt text

Example 1



Because of his role as the Commander in Chief of American forces in the Revolutionary War, and, later, the first President of the United States, George Washington is often called the "Father of his Country".

What would be appropriate alternative text for the image in Example 1?

- A. "Image of George Washington"
- B. "George Washington, the first president of the United States"
- C. An empty `alt` attribute (`alt=""`) will suffice.
- D. "George Washington"

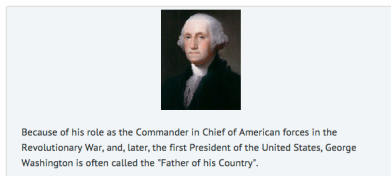
31

Rules of Alt Txt

The alt attribute should *typically*:

- **Be accurate and equivalent** in presenting the same content and function of the image.
- **Be succinct.** This means the correct content (if there is content) and function (if there is a function) of the image should be presented as succinctly as is appropriate. Typically no more than a few words.
- **NOT be redundant** or provide the same information as text within the context of the image.
- **NOT use the phrases "image of ..."** or **"graphic of ..."** to describe the image.

32



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- D. "George Washington"

Alt Txt?

Option **D**
"George Washington"

33

Option A unnecessarily describes the image as an image.
Option B provides extra information that is not presented directly in the image and it is also redundant with content presented later within the text.
Option C (no alt attribute) is not appropriate because the image conveys content that is not directly presented in the surrounding context.

Example 2



George Washington

Because of his role as the Commander in Chief of American forces in the Revolutionary War, and, later, the first President of the United States, George Washington is often called the "Father of his Country".

What would be the appropriate `alt` attribute for the image in Example 2?

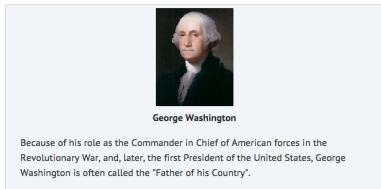
- A. "George Washington"
- B. An empty `alt` attribute (`alt=""`) will suffice.
- C. "Image"
- D. The image does not need an `alt` attribute.

34

Option A would be redundant.

Option C provides extraneous and useless information.

Option D (no alt attribute) is never the right choice - every image must have an alt attribute.



George Washington

Because of his role as the Commander in Chief of American forces in the Revolutionary War, and, later, the first President of the United States, George Washington is often called the "Father of his Country".

What would be the appropriate `alt` attribute for the image in Example 2?

- A. "George Washington"
- B. An empty `alt` attribute (`alt=""`) will suffice.
- C. "Image"
- D. The image does not need an `alt` attribute.

Alt Txt?

Option **B**

35

35

Example 3



George Washington

What would be the appropriate `alt` attribute for the image in Example 3?

- A. An empty `alt` attribute (`alt=""`) will suffice.
- B. "Wikipedia entry for George Washington"
- C. "Read More"
- D. "George Washington"

36



George Washington

What would be the appropriate alt attribute for the image in Example 3?

- A. An empty alt attribute (alt="") will suffice.
- B. "Wikipedia entry for George Washington"
- C. "Read More"
- D. "George Washington"

Alt Txt?

Option **D**
"George Washington"

37

Option D - While the words "George Washington" in the alt attribute are redundant with the text that follows, in this case the redundancy is necessary to adequately describe the function. Option A is not adequate. An image that is the only thing inside a link must never have a missing or null alt attribute. This is because the screen reader must read SOMETHING to identify the link.

Option B provides content that is not available through the image alone

Example 5



The "Products" image is part of a navigation bar.

What would be the most appropriate alt attribute for the "Products" navigation image in Example 5?

- A. "Products"
- B. "Link to Products"
- C. The image doesn't convey content, so (alt="") will suffice.

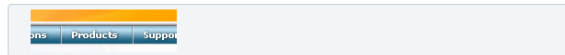
38

A describes both content & function

Option B, is redundant (the screen reader will describe it as a link)

Option C is untrue, there is content + function to convey without text within the link

Example 5



The "Products" image is part of a navigation bar.

What would be the most appropriate alt attribute for the "Products" navigation image in Example 5?

- A. "Products"
- B. "Link to Products"
- C. The image doesn't convey content, so (alt="") will suffice.

Alt Txt?

Option **A**
"Products"

39

title=“...”

- The title attribute, by definition, can be used to provide advisory information
- Many elements support the **title** attribute. Many *do not*
- This triggers a 'tooltip' in all modern browsers on focus/hover
- Be careful overwriting/removing these with javascript
- ALWAYS be used on a <frame> element

40

Bootstrap tooltips are an example of moving and *removing* the accessibility of tooltips, by creating their own version, stored in *another* attribute, and removing the **title** attribute from the DOM (and out of reach of screen readers)

-NOT provide vital information or information necessary for accessibility.
-NOT provide the same information as is available in text or alternative text.
-NOT present the obvious. If the

Links

- Screen readers often navigate by links
- Don't use non-informative phrases ("click here", "more")
- When linking to a resource, specify the resource type *in* the link text: Tax form (PDF)
- Be concise in conveying meaning (avoid wordy links, and avoid too short links)
- Alert the user when a link will open in a new window/tab

41

- alerting a user of a link opening a new tab can be as simple as including a graphic in the link text (with appropriate alt txt of course) that the link will trigger a new window

Links

- Link contents & href should never be empty
- Should be underlined. Users are accustomed to it.
- If altering styling for mouse-over/hover, be sure to have the same effects for focus events too
- **NEVER** style links with *outline: 0* or *outline: none*

Goody Two-Shoes

Published c1888
Topics [Brothers and sisters](#), Orphans, Conduct of life, Education

42

styling links with *outline: 0* or *outline: none*, hides the focus indicator, and makes them less accessible

Invisible Content?

- Many sites include a *Skip Navigation* link, often hidden from users
- There are *limited* cases when text should be hidden from sighted users, and 'shown' to blind users
- Hidden links, such as *Skip Nav*, can be made hidden but *focusable*

43

“In general, content should only be hidden from sighted users and made available to screen reader users when content is apparent visually, but not apparent to screen reader users.”

Only ever use *one* Skip Nav link. More than that is gratuitous

Invisible Content

Phone number: () - extension

- Form labels are a great example of when hidden content is appropriate
- Phone number:
(`<label for="area" class="hidden">Area code</label>`
`<input name="area" id="area" type="text" size="3" maxlength="3">`)

44

No label is needed by a sighted user, as the function of the boxes is clear. However, a blind user would need an explanation of what each of the split boxes represents

Hiding Content

- *visibility: hidden; and/or display:none; ?*
- *width:0px, height:0px or other 0 pixel sizing techniques ?*
- *text-indent: -10000px; ?*
- position: absolute !important; clip: rect(1px, 1px, 1px, 1px);
- Absolutely positioning content off-screen

45

visibility: hidden; and/or display:none;
These styles will hide text from all users. The text is removed from the visual flow of the page and is ignored by screen readers. **Do not use this CSS if you want the content to be read by a screen reader.** But DO use it for content you don't want read by screen readers.

width:0px, height:0px or other 0 pixel sizing techniques

As above, because an element with no

CSS for hidden/focusable

```
.hidden-but-focusable, .sr-only {
  /*http://webaim.org/techniques/css/invisiblecontent/*/
  position: absolute;
  clip: rect(1px, 1px, 1px, 1px);
  top: auto;
  width: 1px;
  height: 1px;
  overflow: hidden;
}
.hidden-but-focusable:focus {
  position: static;
  width: auto;
  height: auto;
  outline: 5px auto -webkit-focus-ring-color;
  outline-offset: -2px;
}
```

46

.sr-only is entirely hidden, and only 'seen' by screen readers.
.hidden-but-focusable are hidden, until tabbed or navigated to, then will appear on screen

Tables

- Make use of table captions to explain what data the table is presenting
`<table><caption>Table Explanation</caption>....`
- Use table headers for row/column headers
`<tr><th>Name</th><th>Age</th></tr>`
- Add the **scope** attribute to each header, specifying whether it is a column or row header

47

```
<table>
  <caption>Shelly's Daughters</caption>
  <tr>
    <th scope="col">Name</th>
    <th scope="col">Age</th>
    <th scope="col">Birthday</th>
  </tr>
  <tr>
    <th scope="row">Jackie</th>
    <td>5</td>
    <td>April 5</td>
  </tr>
  <tr>
    <th scope="row">Beth</th>
    <td>8</td>
    <td>January 14</td>
  </tr>
</table>
```

Name	Age	Birthday
Jackie	5	April 5
Beth	8	January 14

48

Forms

- Use labels:
`<label for="name">Name:</label>`
`<input id="name" type="text" name="textfield">`
- Use fieldsets & legends for all checkbox & radio button groups
- Use **alt** text for all input buttons that are of `type="image"`

49

Forms

- Use **aria-labelledby** if you have need to have two labels for one element (like in a table)
- Use **aria-describedby** to link a another element that has more (or extra) description of the form element.
- You can use a hidden `<label>`, a **title**, or an **aria-label** if a visible label doesn't make sense. (Like on a search box)

50

aria & role tags

Any element you think may be *vaguely* unclear, could probably have a couple of these added.

Examples of **role=** : alert, button, navigation, checkbox, slider, toolbar, widget

role's only need to be applied on elements that normally do not serve that function (`<div role="checkbox">`) or whose function may not be clear without it (`<div role="navigation">`)

aria- are more helper attributes. some examples:
aria-disabled, aria-haspopup, aria-invalid, aria-pressed, aria-controls

Many of the **aria-** take true/false, but others require id's to link to, or text describing the feature.

51

These add extra functionality/
accessibility helpers to your interface.

Javascript Accessible

- Is it an element you can reach from the keyboard?
Is it focusable? Is it keyboard 'clickable'?
- `<div>` & `` are not navigable by keyboards.
- Don't rely on **onclick**, or `.click()`

52

JS cheat

```
makeMouseEventAccessible = function(selector){
  $(selector).attr("tabindex", "0").on("keypress keydown",
function(e){
  if(e.type != "click"){
    var code = (e.keyCode || e.which);
    var k_space = 32; // space bar pressed
    var k_enter = 13; // enter key pressed
    if([k_space, k_enter].indexOf(code) != -1){
      $(this).click();
    }
  }
});
};

makeMouseEventAccessible(".accessible-link");
```

53

Sets a tabindex on the element, to allow it to be navigable + focusable
Listens for a keypress (specifically an enter or space) and triggers a click

Other tidbits

- There is no way to detect a screen reader.
- **tabindex** - don't do it. It confuses blind users to start in the middle of a page
- **longdesc** - is meant to contain a *link* to a longer description. *Not* the text of an actual long description.
- table **summary**, `<thead>`, `<tfoot>`, `<tbody>` - provide no accessibility functionality. They are meant for printing the table.

54

tabindex="0", as used in the previous slide, is ok. tabindex="0" enters that element *into* the index, making it reachable by keyboard. a tabindex of 1 or higher makes the page *start* at those places, and skip content before

Biggest Take-Aways

55

If nothing else...

- *display:none* & *visibility:hidden* hides it for *everyone*
- Make use of *:focus* anywhere you have *:hover*
- Make sure any clickable event is *keyboard* accessible
- Don't make hacky code. (No div's as links/buttons)
- Don't rely on others to do make it accessible. (Bootstrap isn't great)
- Think about *all* your users. Can *everyone* read, view, click, etc ?

56

Resources

57

- Web Accessibility in Mind - <http://webaim.org>
- WAVE Browser plugin - <http://wave.webaim.org>
- Screen Reader Simulation (requires flash) - <http://webaim.org/simulations/screenreader-sim.htm>
- W3C Web Accessibility Initiative (WAI) - <http://www.w3.org/WAI>
- W3C Web Content Accessibility Guidelines - <http://www.w3.org/TR/WCAG20/>
- W3C Aria- & Roles - <http://www.w3.org/TR/wai-aria/>
- Apple's VoiceOver - <http://www.apple.com/accessibility/resources/>
- Section 508 - <http://section508.gov/>
- Dev Blog posts:
<http://dev.blog.archive.org/2015/02/17/website-accessibility/>
<http://dev.blog.archive.org/2015/03/23/website-accessibility-part-2-archive-it-website/>

58

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  position: absolute;
  clip: rect(0, 0, 0, 0);
  top: auto;
  width: 1px;
  height: 1px;
  overflow: hidden;
}
.hidden-but-focusable:focus {
  position: static;
  width: auto;
  height: auto;
  outline: 5px auto -webkit-focus-ring-color;
  outline-offset: -2px;
}
```

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  }
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60

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